CHAPTER 3. BUOY MARKINGS

A. Introduction. This chapter presents all of the information required to properly mark buoys.

B. Selection Guide. Select the marking scheme for buoys by referring to the *Aids to Navigation Manual-Administration* (COMDTINST M16500.7).

C. Preparation and Installation. After the marking scheme selection has been completed, the data sheets in this chapter are the guides for buoy appearance. The actual mechanics of preparing and installing a buoy are outlined in chapter 2 of this volume, where reference is made to both chapter 4 of the *Coatings and Color Manual* (COMDTINST M10360.3) and to this chapter. The *Coatings and Color Manual* provides information on how to apply the markings. This chapter explains where to place the markings by including illustrations of marked buoys on the data sheets, along with notes for clarification of color, sizes, and positions. Note: The U.S. Coast Guard conducts extensive tests to determine what types of films are suitable for use in a marine environment. Qualified films are published on a Qualified Products List (QPL). The QPL is available from G-ECV 202-267-1891.

D. Inspection, Maintenance and Repair On Station.

1. Maintenance/Inspection Schedule. Inspect all buoys annually.

2. Maintenance/Inspection Requirements. Cuts and abrasions over 6 in. in length, or those which penetrate the old coating through to bare metal, shall be repainted. If more than 25 percent of the surface area presented as a visual signal is obscured with bird fouling, marine growth, or physical deterioration (peeling, scaling, etc.), the area should be cleaned or painted to present a "like new" appearance. Painting procedures are specified in the *Coatings and Color Manual.*

3. Paint Procurement. Buoy paint shall be obtained from GSA. The paint conforms to Federal Specification TT-E-002124B of October 7, 1987. If buoys are purchased from commercial sources, we recommend that buoy paint be Government Furnished Equipment (GFE) or the supplier be authorized to buy from GSA.

COLOR***	FED STD 595A CHIP # **	NATIONAL STOCK NUMBER FOR ONE GALLON
RED (Munsell 7.5 R 4/16)	31350	8010-01-241-9734
GREEN (Munsell 2.5 G 5/12)	14193	8010-01-136-5240
YELLOW (Munsell 2.5 Y 8/12)	23655	8010-01-186-3082
WHITE	27875	8010-01-185-9688
BLACK	27038	8010-01-078-8665
BLUE	15182	8010-01-036-6344
INTERNATIONAL ORANGE	12197	8010-01-199-1259
GREEN*	14062	NONE

* This green is authorized for use in the Second Coast Guard District only. It is not available from GSA or E/G-ICP and must be procured by the user. The paint shall conform to Federal Specification TT-E-002124B of October 7, 1987.

** The GSA Specification Branch sells 3X5 inch color chips. Phone (202)472-2205 or (202)472-2140 for price and availability. Use Federal Standard 595A chip numbers when ordering.

*** Samples of paint may be sent to the Coast Guard Research and Development Center for color verification. Samples shall be a colored flat, about 2-inches square, without any holes drilled in them. Provide your phone number and a contact for confirmation within 48 hours. Samples may be sent to:

U.S. Coast Guard
Research & Development Center
Avery Point
Groton, CT 06340
Physics Branch, Paint QA
Attention: R. E. Stachon

4. Retroreflective Film & Character Procurement. The 3M Company and Reflexite Corporation are the only suppliers on the QPL. Films and letters (F to Z) must be purchased from the supplier that has the annual requirements contract. Letters (A to E) and numbers (0 to 9) must be ordered from the E/G-ICP. Conformable, pressure sensitive film, and characters should be used on buoys.

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3.E. General Description Data Sheets.

Radar Reflector Type:

Color. Green (Munsell chip number 2.5G 5/12).

Characters. Largest odd white retroreflective NUMERAL, not to exceed 16 in., that will fit in the available area without crowding. Located as far right as possible on each right-hand radar reflector. Multiple characters are displayed horizontally (side by side).

Retro Panels. Green panels, one on each left-hand radar reflector; height to fit in area of reflector and minimum width of 6 in.

Nonradar Reflector Type:

Color: Same as for Radar Reflector Type.

Characters. Largest odd white retroreflective NUMERAL, not to exceed 16 in. or one-quarter of the buoy freeboard, that will fit without crowding. Located under or beside retro panels on each daymark plate (lighted) or in three sets spaced 120° apart (unlighted). Multiple characters are displayed horizontally (side by side).

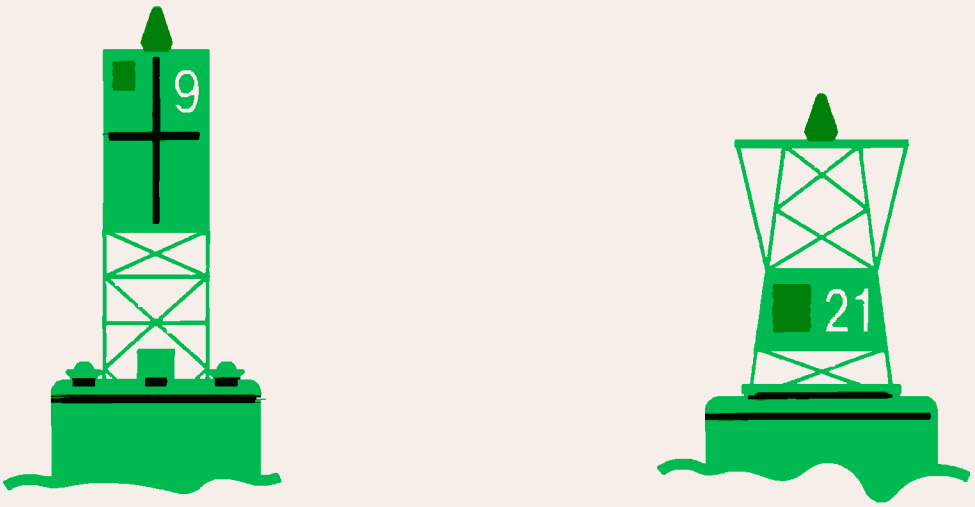
Retro Panels. Green panels, one sized to fit each daymark plate, with a minimum width of 6 in. (lighted), or three panels spaced 120° apart, with a height of 6 in. and a width of two-thirds of the buoy diameter at the point of attachment (unlighted).

Note. Plastic radar reflecting buoys shall be marked like metal nonradar reflecting buoys because they both have similar shapes.

Data sheet 3-E(1). Lateral port marks.

3.E.

Lighted



Unlighted

Figure 3-1. Lateral port marks.

Data Sheet. 3-E(1). (cont'd).

3.E.

LATERAL STARBOARD MARKS

Radar Reflector Type:

Color. Red (Munsell chip number 7.5 R 4/16)

Characters. Largest, even, white retroreflective NUMERAL, not to exceed 16 in., that will fit in the available area without crowding. Located offset to the right, on each right-hand radar reflector. Multiple characters are displayed horizontally (side by side).

Retro Panels. Red panels, one of each left-hand radar reflector; height to fit in area of reflector and minimum width of 6 in.

Nonradar Reflector Type:

Color. Same as for Radar Reflector Type.

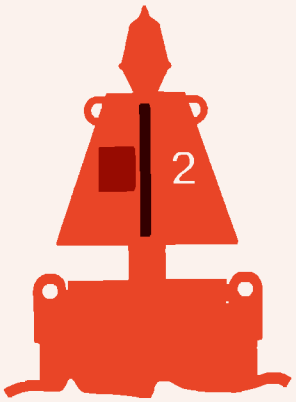
Characters. Largest even white retroreflective NUMERAL, not to exceed 16 in. or one-quarter of the buoy freeboard. Located under or beside retro panels on each daymark plate (lighted) or in three sets spaced 120° apart (unlighted). Multiple characters are displayed horizontally (side by side).

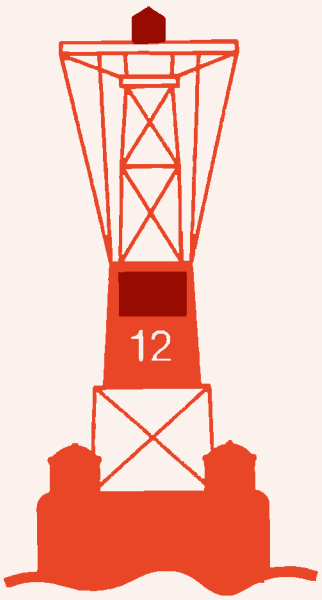
Retro Panels. Red panels, one sized to fit each daymark plate, with a minimum width of 6 in. (lighted), or three panels spaced 120° apart, with a height of 6 in. and a width of two-thirds of the buoy diameter at the point of attachment (unlighted).

Note: Plastic radar reflecting buoys shall be marked like metal nonradar reflecting buoys because they both have similar shapes.

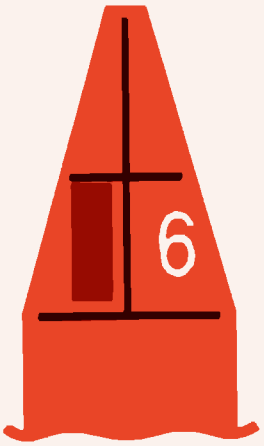
Data Sheet 3-E(2). Lateral starboard marks.

Lighted





Unlighted



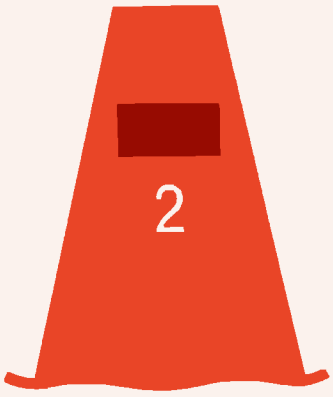


Figure 3-2. Lateral starboard marks.

Data Sheet 3-E(2). Lateral starboard marks. (cont'd).

SAFEWATER MARKS

Radar Reflector Type:

Color. Alternating red and white vertical stripes. (Munsell chip number 7.5 R 4/16 for red, Federal color number 27875 for white.)*

Characters. Largest, white retroreflective LETTER, not to exceed 16 in., that will fit in the available area without crowding. Located offset to the right, on the red, right-hand radar reflector. Multiple characters are displayed horizontally (side by side).

Retro Panels. White panels, one of each white left-hand radar reflector vane; height to fit in area of reflector and minimum width of 6 in.

*Note: Federal color numbers refer to Federal Standard 595a "Color".

Nonradar Reflector Type:

Color. Six alternating red and white vertical stripes. Same colors as radar reflector type.

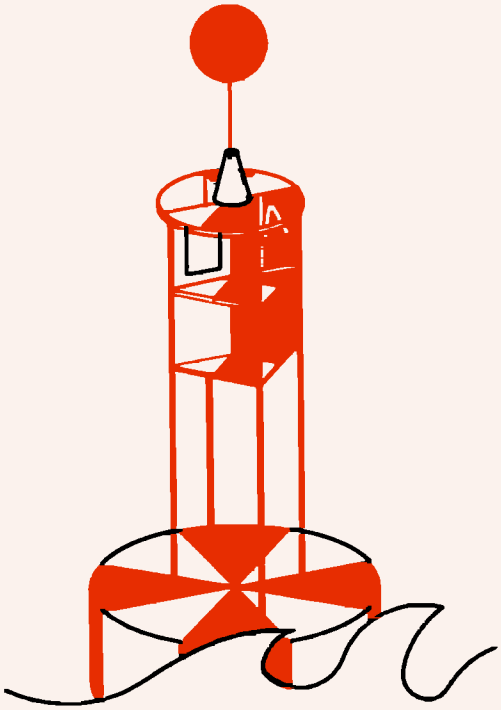
Characters. Largest white retroreflective LETTER, not to exceed 16 in. or one-quarter of the buoy freeboard. Located on the red right-hand side of each daymark plate, (lighted) or in three sets centered on each red vertical stripe (unlighted). Multiple characters are displayed horizontally (side by side).

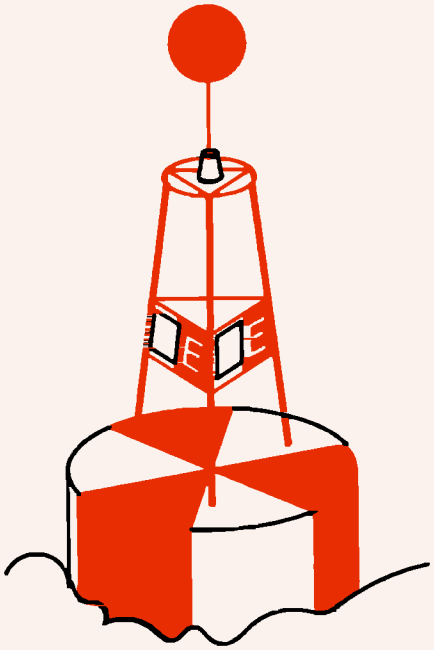
Retro Panels. White panels, one on the white left-hand side of each daymark plate, with a height to fit on the plate and a minimum width of 6 in. (lighted), or three panels, one centered on each white vertical strip (unlighted), with a minimum size of 1 sq ft each.

Data Sheet 3-E(3). Safewater marks.

3.E.

Lighted





Unlighted

Figure 3-3. Safe water marks.

Data Sheet. 3-E(3). (cont'd).

3.E.

PREFERRED CHANNEL MARKS

Radar Reflector Type:

Color. Alternating red and green horizontal bands (Munsell chips 7.5 R 4/16 and 2.5 G 5/12).

Characters. Largest white retroreflective LETTER, not to exceed 16 in., that will fit in the available area without crowding. Located offset to the right, on the right-hand radar reflector. Multiple characters are displayed horizontally (side by side).

Retro Panels. Red panels on buoys with a red band uppermost, green panels on buoys with a green band uppermost. One panel of each left-hand radar reflector; height to fit in area of reflector and minimum width of 6 in.

Nonradar Reflector Type:

Color. Same as for Radar Reflector Type.

Characters. Largest white retroreflective LETTER, not to exceed 16 in. or one-quarter of the buoy freeboard. Located under or beside retro panels on each daymark plate (lighted) or in three sets spaced 120° apart (unlighted). Multiple characters are displayed horizontally (side by side).

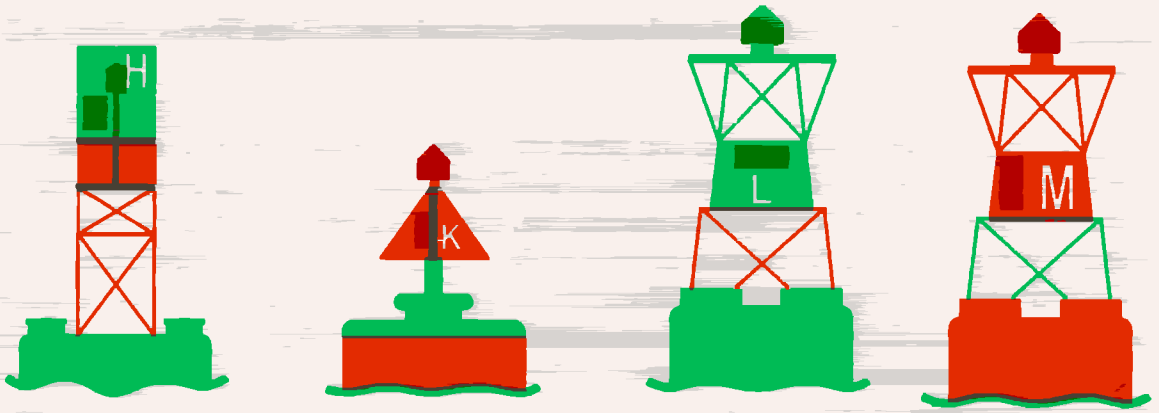
Retro Panels. Red panels on buoys with a red band uppermost, green panels on buoys with a green band uppermost. One panel on each daymark plate, with a height to fit on the plate and a minimum width of 6 in. (lighted), or three panels spaced 120° apart, with a height of 6 in. and a width of two-thirds of the buoy diameter at the point of attachment (unlighted).

Note: Plastic radar reflecting buoys shall be marked like metal nonradar reflecting buoys because they both have similar shapes.

Data Sheet 3-E(4). Preferred channel marks.

3.E.

Lighted

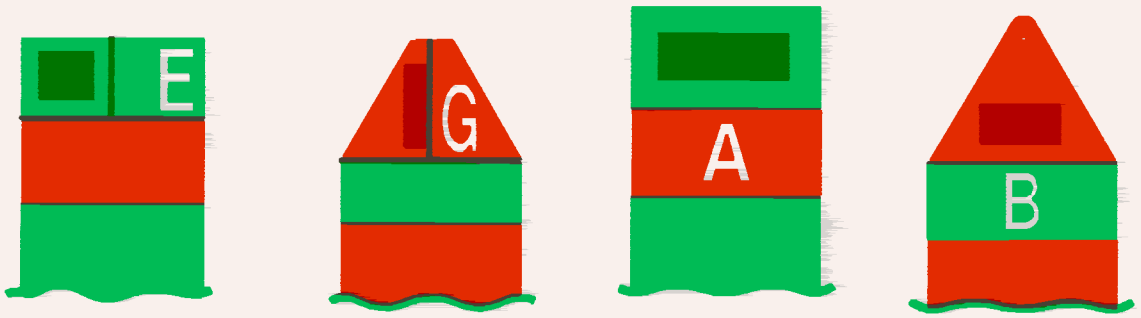


PREFERRED CHANNEL TO STARBOARD TOP BAND GREEN

PREFERRED CHANNEL TO PORT TOP BAND RED

PREFERRED CHANNEL TO STARBOARD TOP BAND GREEN

PREFERRED CHANNEL TO PORT TOP BAND RED



Unlighted

Note. Because of the small surface area available for the alternate color on 1952-, 1942-, or 1928-type lighted buoys, they shall not be installed as junction markers. Existing buoys shall be changed to the 1962-type at the next relief.

Figure 3-4. Preferred channel marks.

Data Sheet 3-E(4). (cont'd).

3.E.

DUAL-PURPOSE PORT, STARBOARD, PREFERRED CHANNEL MARKS

Marking: Radar and Nonradar Reflector Types

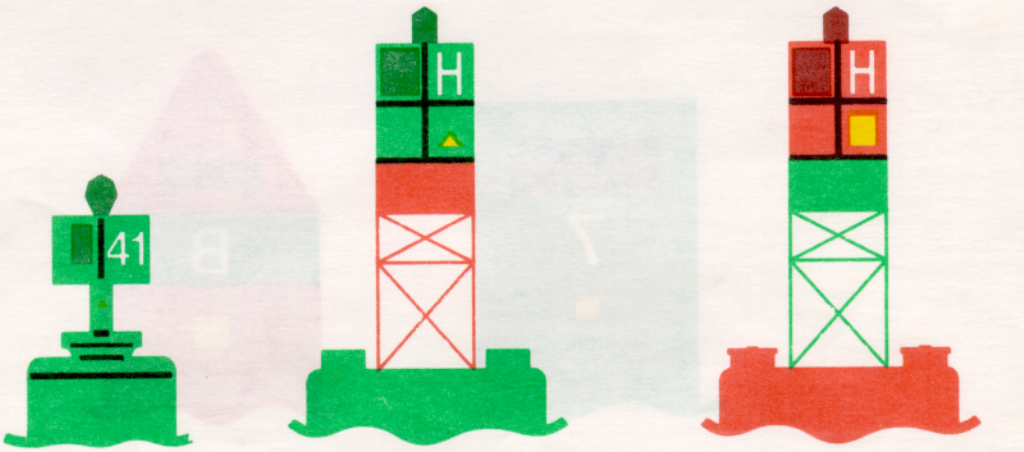
Color. Identical to port, starboard, and preferred channel marks (Data Sheets 3-D(1), 3-D(2), and 3-D(4).

Retro Panels. In addition to the red and green retro panels outlined for port, starboard, and preferred channel marks, dual-purpose marks shall have squares and triangles made from yellow retroreflective material. The squares indicate that the aid is a port mark for the intracoastal waterway, regardless of the color or number of the aid. Conversely, triangles indicate a starboard side mark for the intracoastal waterway. The size of a square should be between 3 and 6 in. on a side and the size of a triangle should be between 4 and 6 in. on a side, depending on available mounting area and the requirement that the area of the square or triangle shall not exceed one-quarter of the area of the red or green retro panel used to note the primary channel markings. Locate the dual-purpose markers beneath each combination of primary channel characters/retro-panel markings using the available space on radar reflector vanes, daymark plates, or the buoy body, as shown in Figures 3-5 and 3-6.

Data Sheet 3-E(5). Dual-purpose port, starboard, and preferred channel marks.

3.E.

MAIN CHANNEL:	PORT	PORT	STARBOARD
I.C.W.:	STARBOARD	PORT	PORT

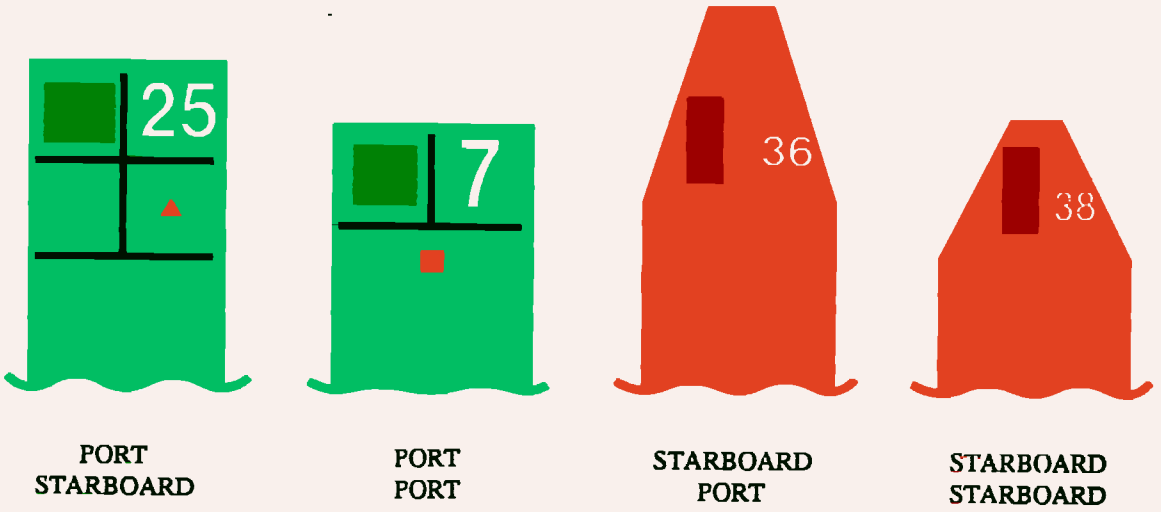


MAIN CHANNEL:	PORT	PREFERRED PORT	PREFERRED STARBOARD
I.C.W.:	STARBOARD	STARBOARD	PORT

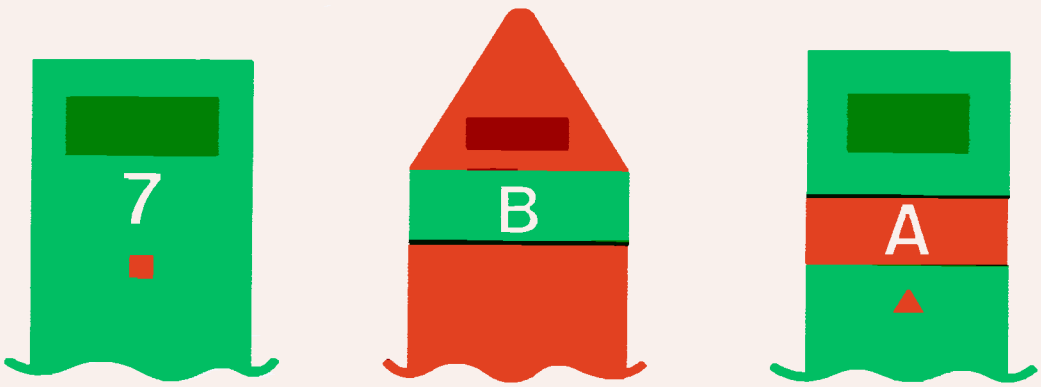
Figure 3-5. Dual-purpose port, starboard, and preferred channel marks.

Data Sheet. 3-E(5). (cont'd).

3.E.



MAIN CHANNEL:	PORT	PORT	STARBOARD	STARBOARD
I.C.W.:	STARBOARD	PORT	PORT	STARBOARD



MAIN CHANNEL:	PORT	PREFERRED STARBOARD	PREFERRED PORT
I.C.W.:	PORT	PORT	STARBOARD

Figure 3-6. Dual-purpose port, starboard, and preferred channel marks.

Data Sheet. 3-E(5). (cont'd).

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SPECIAL AID MARKS

Radar Reflector Type:

Color. Yellow Munsell chip number 2.5 Y 8/12.

Characters. Largest black nonretroreflective LETTER, (Federal color no. 27038) not to exceed 16 in., that will fit in the available area without crowding. Located offset to the right, on the right-hand radar reflector. Multiple characters are displayed horizontally (side by side). Mount the black letter on a yellow retro panel.

Retro Panels. Yellow panels, one on each left-hand radar reflector, height to fit in area of reflector and minimum width of 6 in.

Nonradar Reflector Type:

Color. Same as for Radar Reflector Type.

Characters. Largest black nonretroreflective LETTER, not to exceed 16 in. or one-quarter of the buoy freeboard, that will fit without crowding. For buoys with daymark plates, install the letters to the right of or under the retro panels. For buoys without daymark plates, install 3 letters spaced 120° apart. Mount the letters on yellow retro panels.

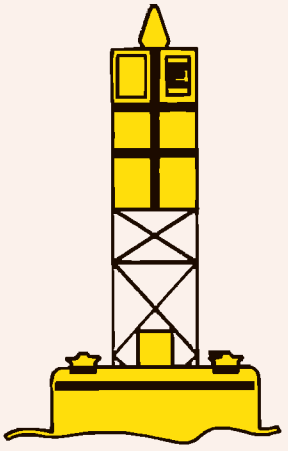
Retro Panels. Yellow panels, one sized to fit each daymark plate, with a minimum width of 6 in. or three panels spaced 120° apart, with a height of 6 in. and a width of two-thirds of the buoy diameter at the point of attachment.

Note: Plastic radar reflecting buoys shall be marked like metal nonradar reflecting buoys because they both have similar shapes.

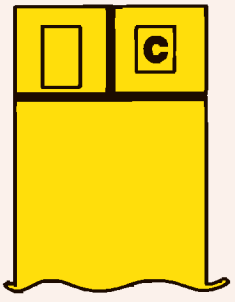
Data Sheet 3-E(6). Special aid marks.

3.E.

Lighted



Unlighted



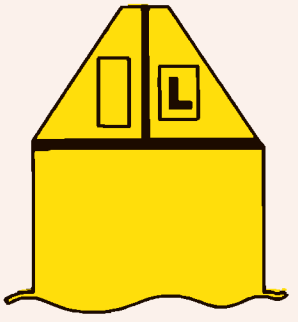


Figure 3-8. Special aid marks.

Data Sheet 3-E(6). (cont'd).

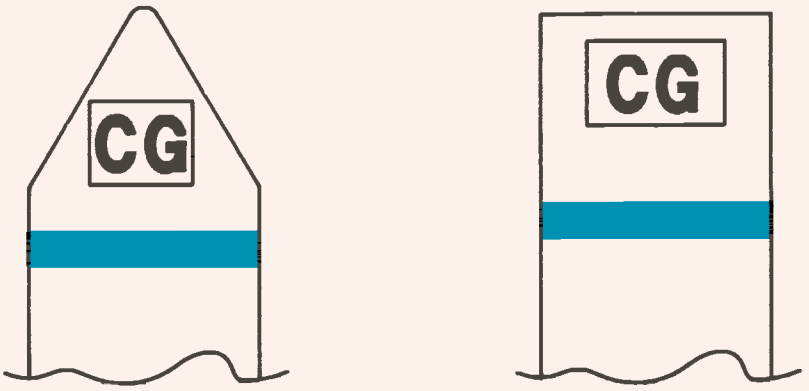
COAST GUARD MOORING BUOYS

Color. White with a blue band (Federal Color Nos. 27875 and 15182).

Appearance. The buoy body shall be white with a narrow blue band located midway between the buoy top and the waterline.

Characters. The buoy shall display three sets of black nonreflective, "CG" characters, sized to fit onto the white retroreflective panels. Multiple characters are displayed horizontally (side by side).

Retro Panels. Three white panels spaced 120° apart, with minimum height of 6 in. and a minimum width of two-thirds of the buoy diameter at the point of attachment.



Data Sheet 3-E(7). Coast Guard mooring buoys.

WESTERN RIVERS LEFT DESCENDING BANK MARKS

Radar Reflector Type:

Color. Solid red (Munsell chip 7.5 R 4/16).

Characters. No LETTERS or NUMERALS shall be used.

Retro Panels. Red panels, one on each left-hand radar reflector vane; height to fit in available area and width up to 12 in.

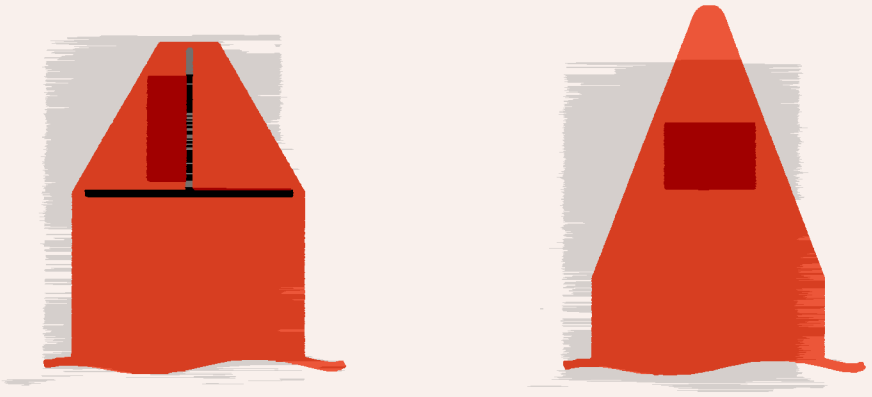
Nonradar Reflector Type:

Color. Same as for Radar Reflector Type.

Characters. Same as for Radar Reflector Type.

Retro Panels. Three red panels spaced 120° apart, with a minimum height of 6 in. and a width of two-thirds of the buoy diameter at the point of attachment.

Note: Plastic radar reflecting buoys shall be marked like metal nonradar reflecting buoys because they both have similar shapes.



Data Sheet 3-E(8). Western rivers left descending bank marks.

WESTERN RIVERS PREFERRED CHANNEL MARKS

Radar Reflector Type:

Color. Red and green horizontal bands (Munsell chips 7.5 R 4/16 and 2.5 G 5/12.)

Characters. No LETTERS or NUMERALS shall be used.

Retro Panels. Red or green panels to match top band color, one on each left-hand radar reflector vane; height to fit in available area and width up to 12 in.

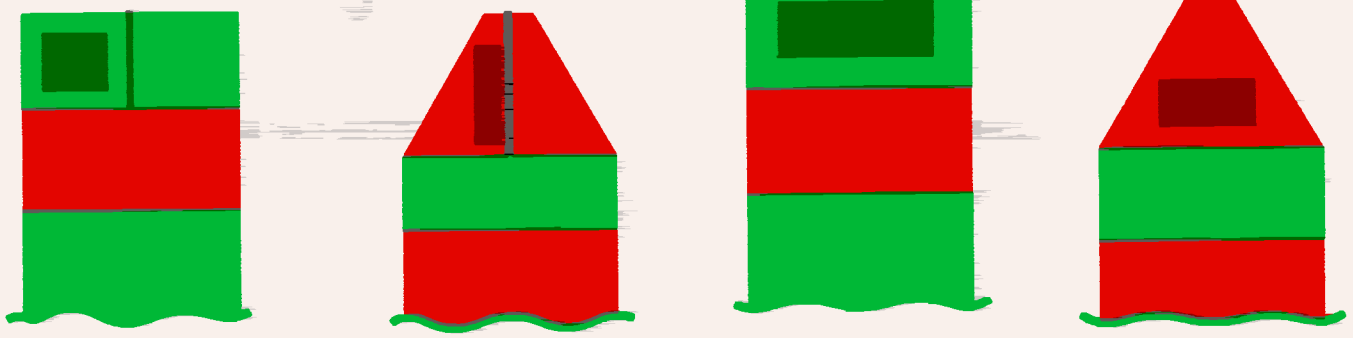
Nonradar Reflector Type:

Color. Same as for Radar Reflector Type.

Characters. Same as for Radar Reflector Type.

Retro Panels. Three red or green panels to match top band color located on top band spaced 120° apart, with a height of 6 in. and a width of two-thirds of the buoy diameter at the point of attachment.

Note: Plastic radar reflecting buoys shall be marked like metal nonradar reflecting buoys because they both have similar shapes.



PREFERRED CHANNEL TO STARBOARD

PREFERRED CHANNEL TO PORT

PREFERRED CHANNEL TO STARBOARD

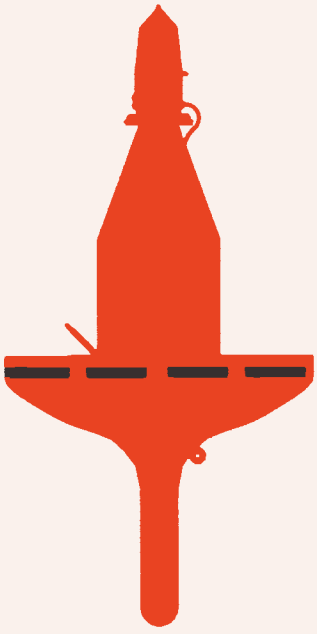
PREFERRED CHANNEL TO PORT

NOTE. Buoys used to mark both coinciding Main and I.C.W. channels.

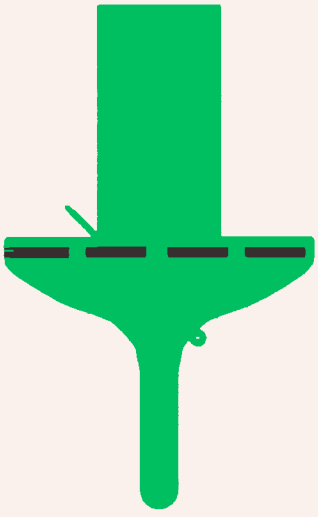
Data Sheet 3-E(10). Western rivers preferred channel marks.

TEMPORARY MARKS

Markings: The purpose of a temporary mark is to provide an interim mark when an operational aid is damaged, missing, or unrepairable. It shall have markings as similar as possible to the markings of the aid that it replaces.



LIGHTED NUN BUOY



UNLIGHTED CAN BUOY

Data Sheet 3-E(11). Temporary marks.

3.E.

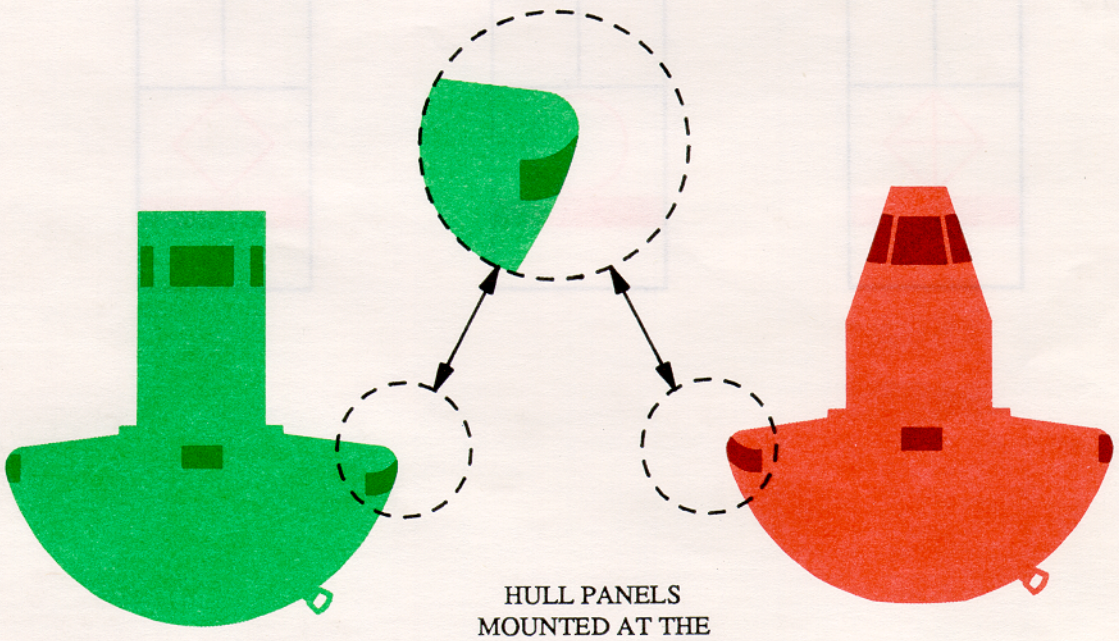
WESTERN RIVERS FAST WATER PORT AND STARBOARD MARKS

Color. Solid green or solid red (Munsell chips 2.5 G 5/12 and 7.5 R 4/16) for port or starboard markers, respectively.

Characters. No LETTERS or NUMERALS shall be used.

Retro Panels. Four green (port) or red (starboard) panels mounted on each daymark, space 90o apart, with aminimum height of 6 in. and a width equal to one-half of the buoy diameter at the point of attachment. To provide for the possible loss of a daymark, four additional strips, 3 in. by 6 in., of the same color as the daymark panels, shall be mounted on the hull directly below the daymark panels.

Note: Occasionally, fast water buoys may be used in places other than the western river system. In these cases, the buoys shall also include the appropriate number for port or starboard buoys. The numeral shall be the largest odd or even white retroreflective numeral, not to exceed 16 in., that will fit in the available area below the topmost retro panels without crowding.



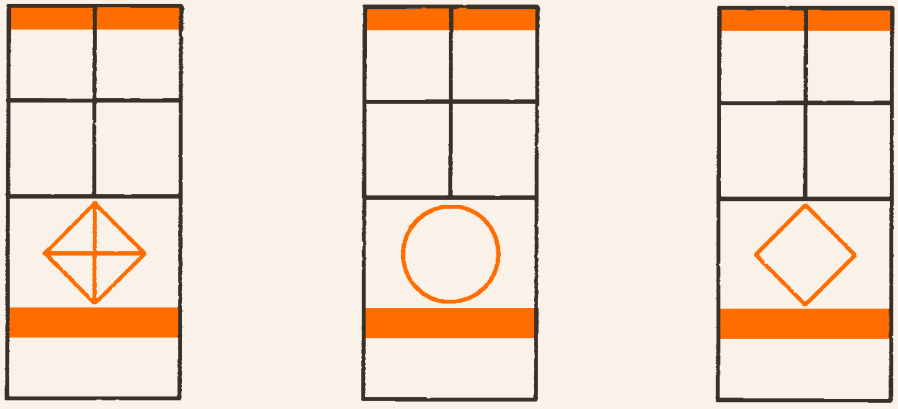
HULL PANELS
MOUNTED AT THE
TURN OF THE BILGE

Data Sheet 3-E(12). Western rivers fast water port and starboard marks.

INFORMATION AND REGULATORY MARKS

Markings: The vast majority of these marks are can buoys. They sahll be white (Federal color number 27875) with orange (Federal color number 12197) retroreflective bands and buoy warning symbols. The warning symbols shall be placed 180° apart. An open diamond indicates a "Danger" area. A cross centered in the diamond shape indicates an "Exclusion" area. An open circle indicates a "Controlled" area. Typical information and regulatory marks are pictured below.

Occasionally, there may be need to light an information and regulatory mark. If lighted, the mark shall display a white light.



Data Sheet 3-E(13). Information and regulatory marks.